From:	Coltrain, Katrina
To:	McMillan, Teresa
Cc:	cradu@eaest.com; lvega_eaest.com; Turner, Philip; Barry Forsythe; Todd Downham
Subject:	RE: Wilcox TO#128 - DQO Table and SW, Sed. and Pond Sampling
Date:	Tuesday, March 08, 2016 8:02:00 AM
Attachments:	Decision tree example.pdf eco_update_GWtoSW.pdf

Teri, please find listed below my comments. Some of the comments provided for each document may be redundant.

General:

1. How will the sample maps be generated?
2. Is it possible to have the coordinates put in a KMZ file so that we can use Google earth?
3. Or perhaps a GIS project that can be uploaded so that we can view and manipulate the maps and data as we review site information?
4. I know that Scribe is to be our project database, can the above be done using scribe?

DQO Document

1. Step 1: State the Problem
    a. Pesticides/PCBs should be added to the list of parameters; however, at a reduced percentage. I am thinking 15%. We did not find pesticides/PCBs in any of the residential soil samples and neither of these have been found in previous site assessments or expanded site inspections.
    b. Dioxins/furans: these are not expected to be present. To my knowledge, they have not been part of any sample analysis thus far. These perhaps can have a lower percentage of about 10%.
    c. Are the SVOCs and PAHs (SIM) two separate analyses?
    d. For sediment, additional parameters will need to be included: grain size (20%), total organic carbon, and pH.
    e. For Surface Water, pH and hardness will need to be added. Additional parameters will be needed if toxicity tests are done: TDS, TSS, pH, hardness, Alkalinity, organic carbon, and AVS. In addition, given that the eco risk relies on dissolved data, the water quality standards are dissolved criteria, and the trespasser/recreator is an incidental water ingestion, can all surface water samples be dissolved? Do we really need total surface water data? Do the risk assessors or other team members have any comment related to water quality parameters?
    f. What is the rationale for selecting a distance of 200ft between sample locations?
    g. Please also include a decision tree that can be used by the field team should the sample location be insufficient for sampling. For example, moving upstream no more than 20ft to find a suitable location. Also refer to examples attached.
    h. VOCs do not need to be analyzed in surface water.
    i. Although not within the last year, sediment and surface water data are available for Sand Creek, the West Tributary, Pond 1, and Pond 2.
2. Step 4: Define the Boundaries
    a. What is the rationale for using Pond 8 as the reference vs Pond 9? Pond 9 may be more appropriate since it is part of and holds water for the East Tributary.
    b. Sediment samples should be the upper 6 inches.

c. For surface water, the water may be too shallow for sample collection at 1ft depth. Should the sample be a composite of the water column rather than a grab at a specified depth?
d. Sand Creek Bridge: refer to comments on the sample plan.

3. Step 5: Develop the Analytic Approach
   a. It is stated that the GW/SW elevations will be used to determine interaction and seasonality. How can be evaluate seasonality when we will most likely only have data representing the summer? Upwelling can be investigated through the use of piezometers. See attached reference. Does the team think that this level of investigation is necessary at this time?
   b. It is stated that if contamination if found at Confluence 1, then the next phase of sampling will extend 1000ft downgradient. If samples are taken every 200ft then this is only an additional 5 samples, not 10. In addition, this seems logical for sediment, but not for surface water. Perhaps, further discussion on this.
   c. It is stated that the vertical extent of sediment will be investigated should sediment data show contamination. Will the additional foot be a composite across that depth? Since eco receptors are not generally found below 6inches, this investigation is for nature and extent only?

Sample Strategy Document

Step 7: Detailed Sample Plan

1. Stream/Tributary
   a. Please include the rationale for sampling every 200ft.
   b. Please consider the incorporation of a decision tree that can be used by the field personnel should a sample location be insufficient.
   c. Please collect samples with a slight bias towards the site. This should include any soils that have migrated from the site and into the creek.
   d. When sampling the point bar, what area of the bar will be sampled and why?
   e. Samples should be collected from 0-6inches for sediment.
   f. Surface water may not be deep enough to collect the sample from a depth of 1ft. What alternate process will be used? Should the water sample be a composite of the water column?
   g. It is stated that an estimated 60 samples will be taken from Sand Creek, the East Tributary, and the West Tributary. Assuming an equal split appears to ‘overload’ the West Tributary.
2. Confluence Locations
   a. As mentioned in Todd’s comments, there is a drainage just downgradient of the Confluence 2 location. Addition this locations, now make there 4 confluence locations along Sand Creek.
3. Source Runoff
   a. Are these samples meant to supplement those taken every 200ft within Sand Creek, the East Tributary, and the West Tributary?
4. Bridge
   a. It is stated that 5 surface water samples will be collected. The primary concern was oil-type material at depth. There is only a need for one or two: immediately upgradient and immediately downgradient of the bridge.
   b. It is stated that 15 sediment samples will be collected. The extent of contamination needs to be mapped. One sample of the material should

be sufficient to characterize it. Perhaps, two to three to characterize the sediments underneath.

c. What of the possible locations for other oil-type material that is buried under sediment? Does the team think that transects within point bar areas to visually confirm presence or absence is necessary at this time?

5. Seeps
    a. It is stated that seeps will be sampled. I do not think that we will actually be able to sample the seeps; however, we may get enough water.
    b. It is stated that if the seep is a wet area along the bank, then a sample of the sediment/surface just below where the seep enters the creek should be collected. In addition, a sediment/surface water sample will be collected at the nearest downstream point bar. This should only be done if there are no other samples in the vicinity. This and the source runoff areas will most likely coincide and duplication of samples will not be needed.
    c. We only know of two, possibly three seep locations not 10. At most, 3 seep, 3 surface water, and 3 sediment.
6. Creek Reference Values
    a. For the West Tributary, an upstream sample will most likely yield high concentrations as this tributary flows from a former refinery just north of the site. I do not think that this can be or should be used as a reference.
    b. Previous investigations have taken sediment and surface water sampling in upstream locations. Can this data be used rather than collecting additional data?
    c. This strategy appears to provide us with 3 reference/upgradient data points. Should more samples be collected to produce a statistically sound ‘background’ number?
7. Ponds
    a. The number of samples per pond should be sufficient to identify any in flow source areas as well as any settling areas. What is the rationale for the selection of the number of samples to be taken from each pond? Ponds 2 through 6 are independent ponds that rely on rain and runoff whereas Ponds 1 and 7 are connected with stream flow. Ponds 1, 2, 3, 4, and 6 area associated with areas that were used in the past by the refinery as either separation ponds or tank storage areas. Pond 5 is a new pond dug by the property owner, but is downgraident of a former storage tank location.
    b. Based on the presented text description, collect 4 samples for each pond: Ponds 2 through 6.
    c. Based on the presented text description, collect 5 samples for Pond 1: intake, outflow, 1 center and 2 sides.
    d. Based on the presented text description, collect 7 samples for Pond 7: intake, outflow, 1 center and 4 sides.
8. Pond Reference
    a. What is the rationale for using Pond 8 as the reference vs Pond 9? Pond 9 may be more appropriate since it is part of and holds water for the East Tributary.
    b. This strategy appears to provide us with 4 reference/upgradient data

points. Should more samples be collected to produce a statistically sound 'background' number?

9. Wetlands: It is my understanding that any wetland areas are located further downgradient from the site.
10. Please verify that this is the estimated number of sediment and surface water samples being proposed. Under this current plan, approximately 130 sediment and surface water samples are planned and will require substantial resources to collect and analyze. What is the estimated length of waterway included in this strategy?

	Total estimated samples		
		Sediment	Surface Water
1	Sand Creek	20	20
	East Tributary	20	20
	West Tributary	20	20
2	confluence 1	1	1
	confluence 2	1	1
	confluence 3	1	1
	confluence 4	1	1
3	source runoff	10	10
4	Bridge	2	2
		4	
5	Seeps	3	3
		3	3
		3	3
6	reference East	1	1
	reference West	1	1
	reference Sand	1	1
7	Pond 1	5	5
	Pond 2	4	4
	Pond 3	4	4
	Pond 4	4	4
	Pond 5	4	4
	Pond 6	4	4
	Pond 7	7	7
8	reference Pond	4	4
		128	124

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From: McMillan, Teresa [mailto:tmcmillan@eaest.com]
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Subject: Wilcox TO#128 - DQO Table and SW, Sed. and Pond Sampling

Katrina,

Please find the edits to the DQOs and proposed surface water and sediment sampling strategy. Please let me know if you have any questions.

Thanks,

Teri McMillan